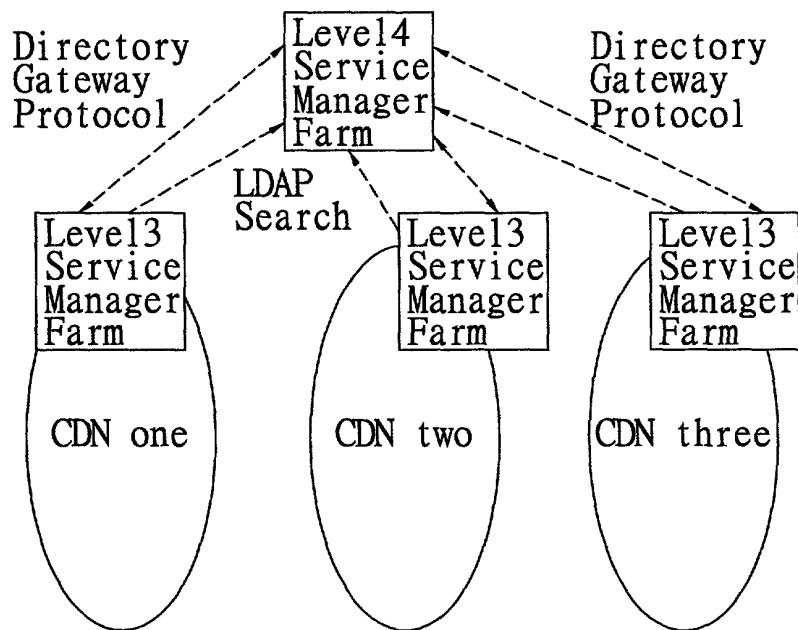


#y

FIG. 1
Content Peering for Multiple CDN Networks



Although it depends on directory information forwarding policy, typically

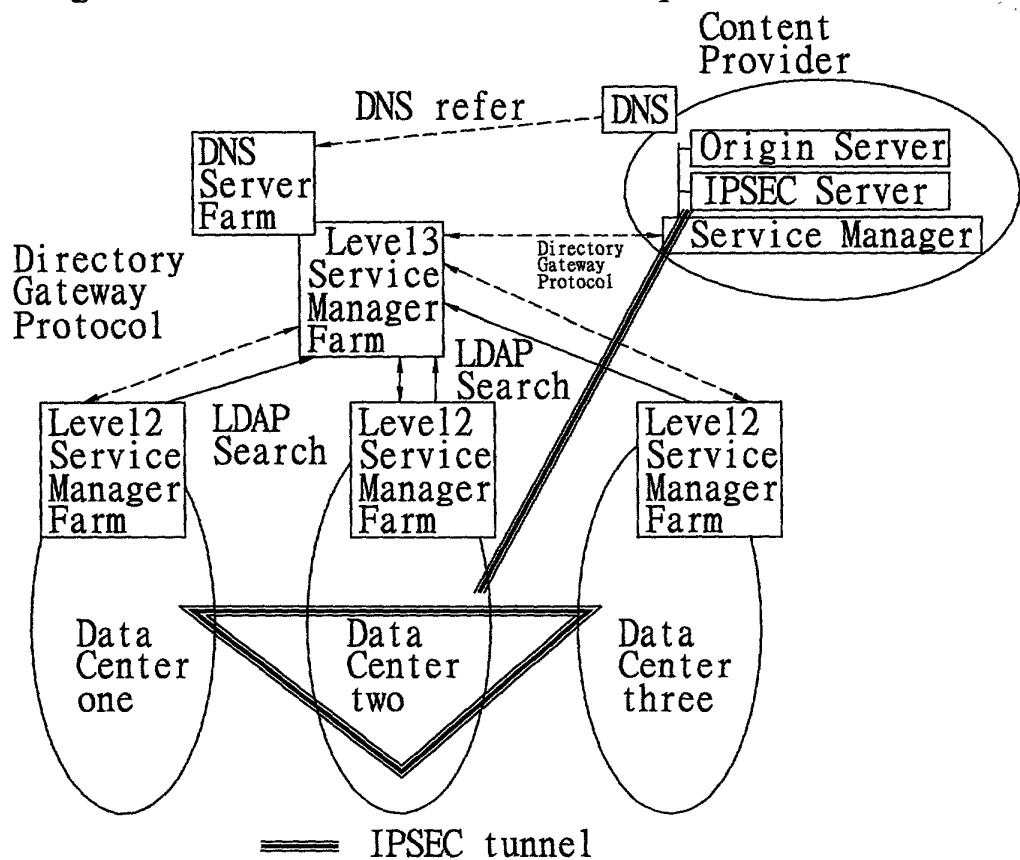
Level4 Service Manager stores the content location information of CDN one, CDN two and CDN three.

Level3 Service Manager of CDN one stores only the content location information of CDN one.

Level3 Service Manager of CDN two stores only the content location information of CDN two.

Level3 Service Manager of CDN three stores only the content location information of CDN three.

FIG. 2a
Integrated Service Network of Multiple Data Centers



Although it depends on directory information forwarding policy, typically

Level13 Service Manager stores the content location information of Data Center one, Data Center two and Data Center three.

Level12 Service Manager of Data Center one stores only the content location information of Data Center one.

Level12 Service Manager of Data Center two stores only the content location information of Data Center two.

Level12 Service Manager of Data Center three stores only the content location information of Data Center three.

Data going across Data Center can go through IPSEC tunnel to guarantee privacy and security or even form a VPN among Data Centers.

FIG. 2b
Integrated Service Network of Multiple Data Centers

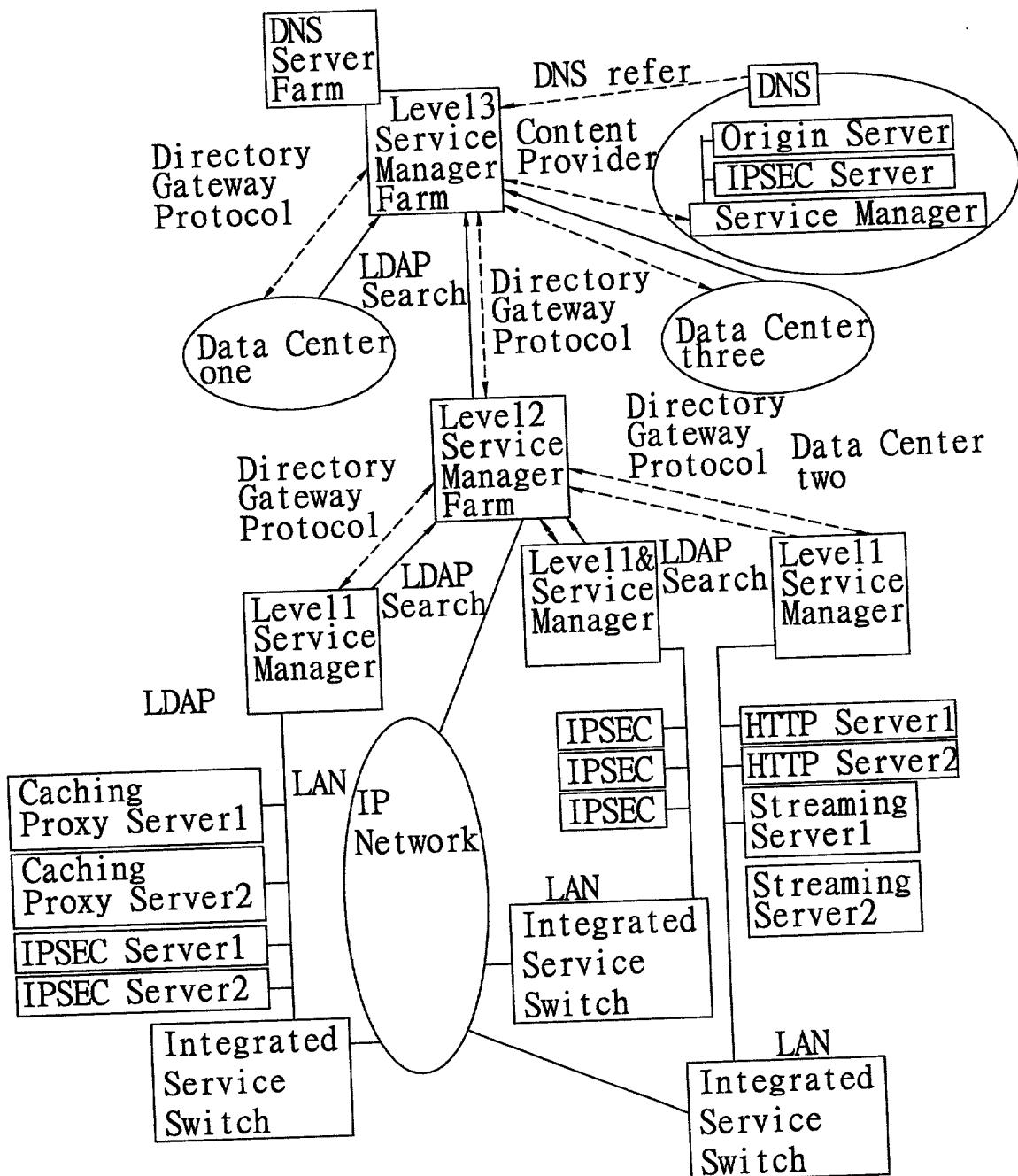


FIG. 3
Service Manager and Caching Proxy Server Farm in a Data Center

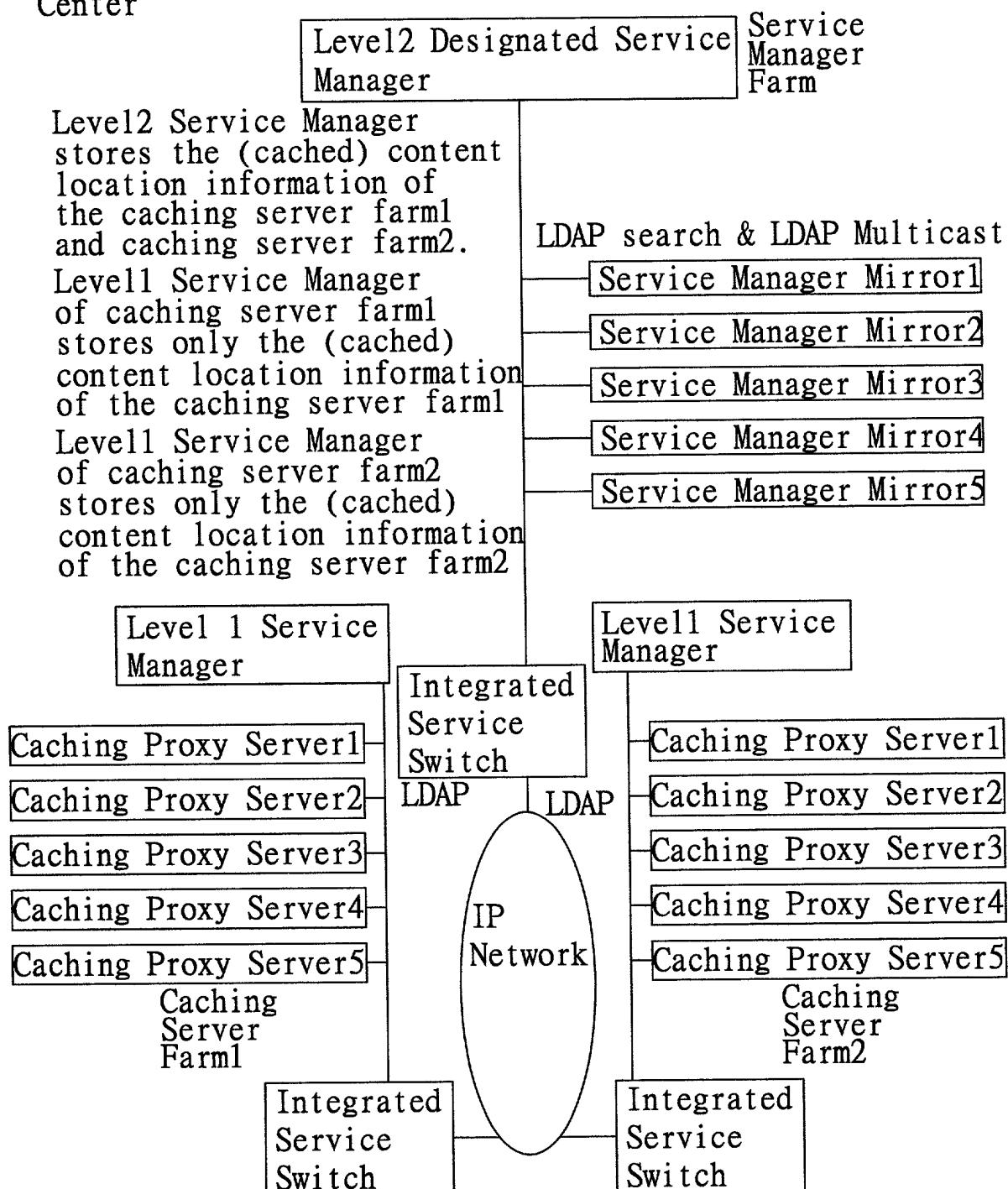


FIG. 4
Directory information Multicast Update in Service Manager Farm

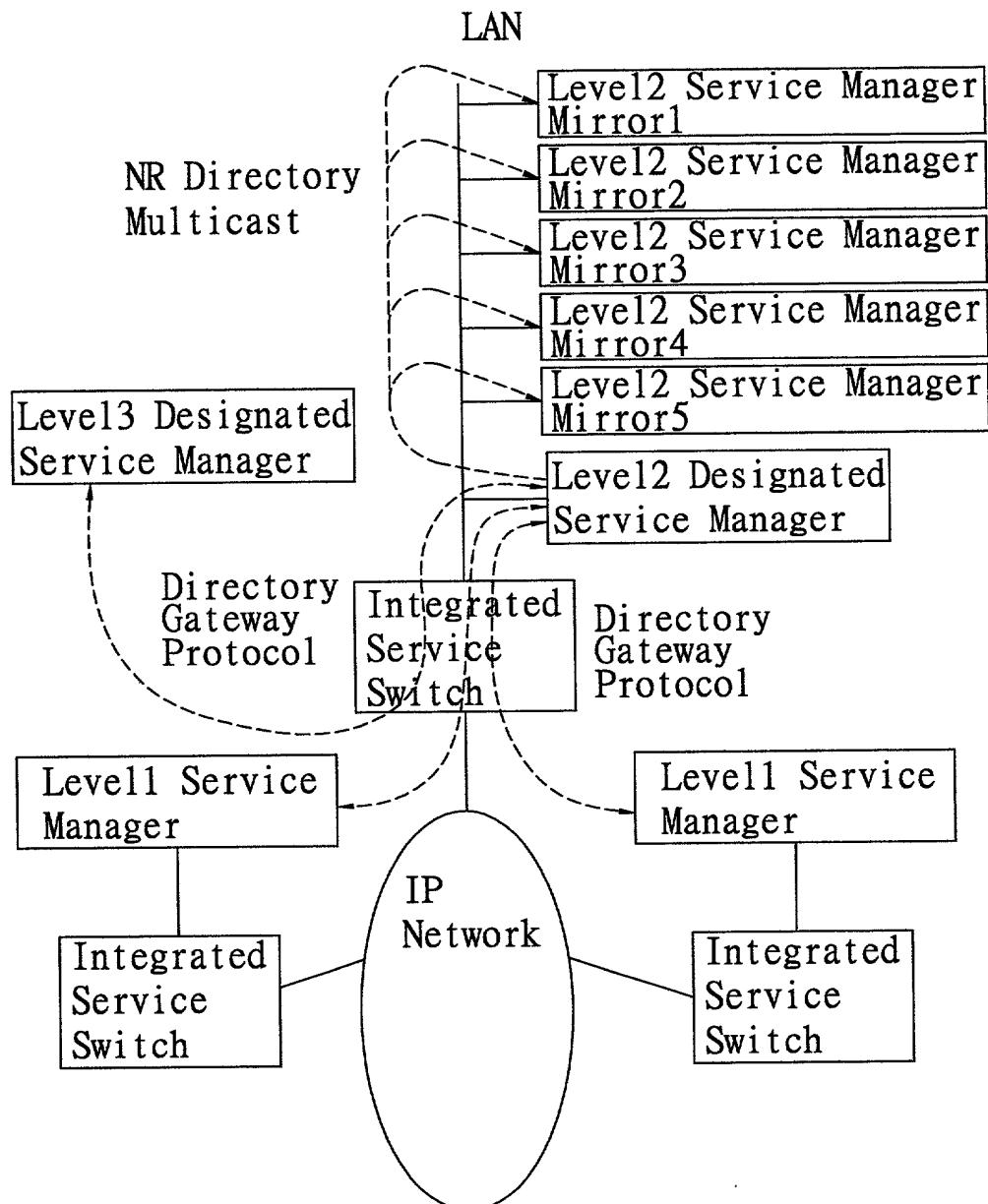


FIG. 5
Integrated Service LAN
SE:Service Engine
ISS:Integrated Service Switch
SM:Service Manager(Level 1)
BSM:Backup Service Manager(Level 1)

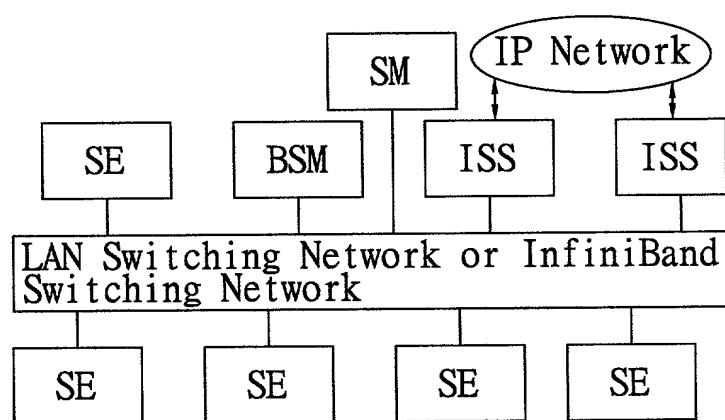
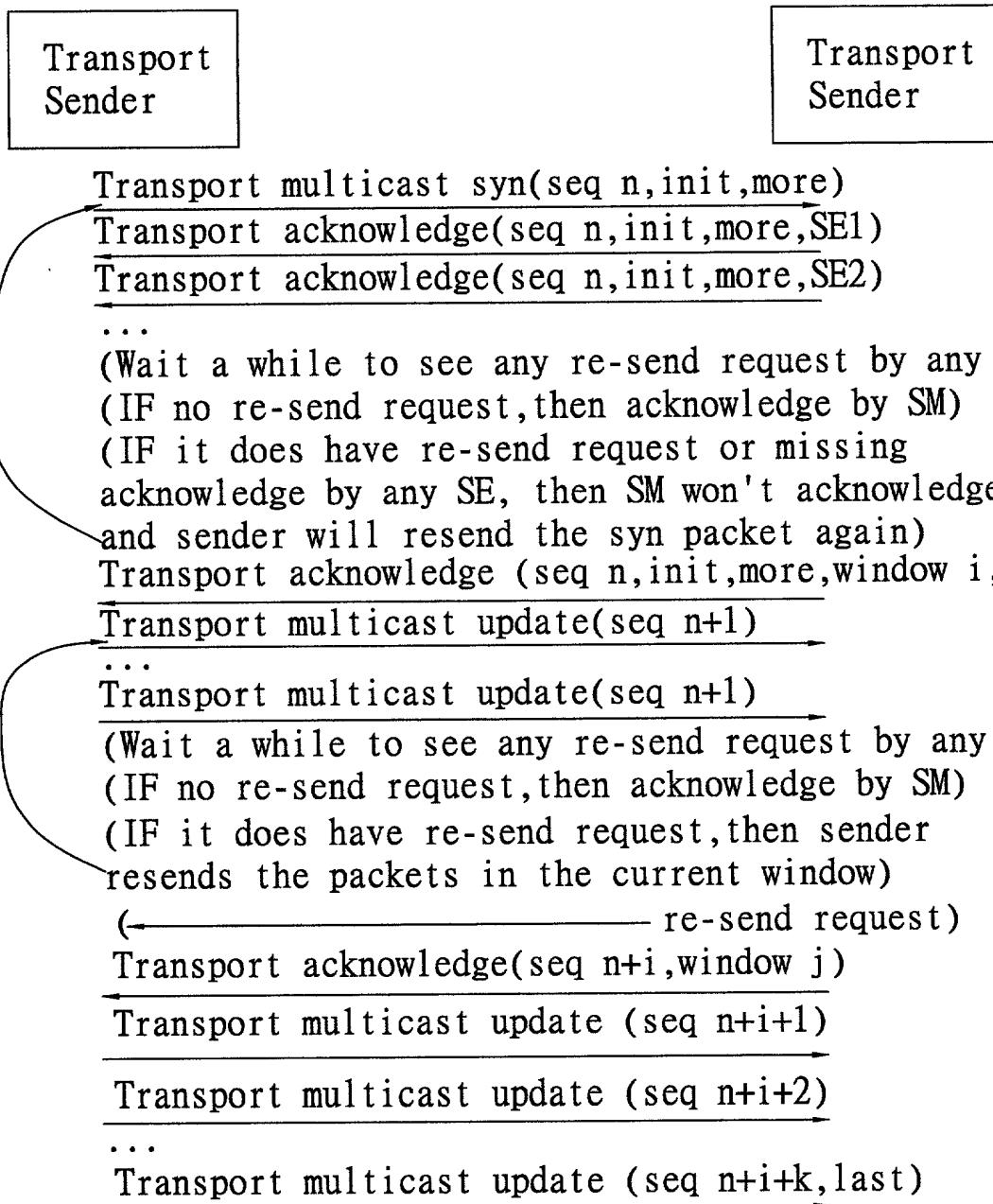


FIG. 5
Reliable Multicast Transport Protocol Sequence

SM:Service Manager
SE:Service Engine



Transport acknowledge(seq n+i+k, last by SE1)
Transport acknowledge(seq n+i+k, last by SE2)
...
Transport acknowledge(seq n+i+k, last by SM)

Note that acknowledge and re-send request are both
multicast packets.

FIG. 6

Transport multicast about operation Sequence

Transport multicast about(seq n+i+k, last)
→
Transport acknowledge(seq n+i+k, last by SE1)
←
Transport acknowledge(seq n+i+k, last by SE2)
...
Transport acknowledge(seq n+i+k, last by SM)

This about operation allow sender to about the multicast operation for whatever reason, it can send a Transport multicast about message and should acknowledge by all others and SM. SM will acknowledge until all others have acknowledged.

FIG. 7
Reliable Multicast Directory Update Protocol Sequence



LDAP_MULTICAST_OP is one of the following operations:

- LDAP_ADD,
- LDAP_DELETE,
- LDAP MODIFY_ADD,
- LDAP MODIFY_REPLACE,
- LDAP MODIFY_DELETE

LDAP_OP multicast(seq n,init,more)



...

LDAP_OP multicast(seq n+i,last)

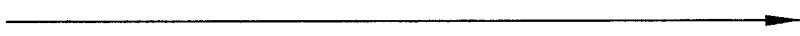


FIG. 8
Reliable Multicast Management Protocol Sequence



SNMP_MULTICAST_OP is one of the following operations:

SNMP_GET,
SNMP_GETNEXT,
SNMP_SET

SNMP_MULTICAST_OP multicast(seq n,init,no more)

